**Institute of Business Administration**

**Faculty of Computer Science**

**Course Outline**

**ICT 512 – Advanced Web Technologies**

Credit hours: **3**

Prerequisites: **None**

Recommended prior learning: **Some prior knowledge of HTTP, HTML and WWW.**

Co-requisites: **None**

Barred combinations: **None**

Directed Unsupervised Activity: **200 hrs**

Course Tutor: **Shakeel A. Khoja**

**Consultation hours for this course: Mon-Fri xx:xx**

**Course aims:**

To deliver in-depth knowledge of the basic concepts and general principles associated with web application development, illustrating specific technologies. To provide an understanding of different concepts, architectures, techniques, and infrastructures for service oriented computing in web development.

**Course synopsis:**

The course explains the principles and practice of web services. It provides a comprehensive overview of state of the art web services and associated disciplines, relating concepts to practical examples and emerging standards.

The objective of this course....

**Learning Outcomes:**

1. **Intellectual Outcomes**

Upon completion of this course the student will be able to:

* 1. Evaluate the key issues involved in developing web services.
  2. Use XML, XSL, XLink and SMIL appropriately to create documents.
  3. Design the information structure of an entire Web site.
  4. Understand the algorithms of text- and image-based search engines.
  5. Make use of metadata schemas to describe resources and to process those descriptions.

1. **Knowledge Outcomes**

Upon completion of this course the student will be able to understand:

* 1. Principles of Web Architecture
  2. Principles of Web Information Design
  3. History and Current Research Issues in Hypertext

**3. Ability Outcomes**

Upon completion of this course the student will be able to:

* 1. Creating Web Information Resources using the latest W3C standards

**Indicative learning strategy:**

Topics Covered:

\* Current Web data standards

o XML, XSL, XLink, DOM, SMIL

o Processing XML documents

o Deploying XML data

\* Current Web metadata standards

o RDF, RDF-SCHEMA

o Ontologies, Dublin Core

o Metadata processing

o Surfing the semantic web

\* Hypertext Linking

o Open Hypermedia philosophy

o Hypertext history

o The Missing Link: problems and solutions

\* Web Site Construction

o Hypermedia Engineering

o Hypermedia Development Methods

o Hypermedia Developent Techniques

o Web Site Maintenance

o Case study

\* Web Searching

o Information retrieval history

o Search engine algorithms

o Case studies: Harvest, Google.

**Indicative references/learning materials:**

**Text Book:** Munindar P. Singh and Michael N. Huhns, Service Oriented Computing Semantics, Processes, Agents, 2005, John Wiley.

Reference Books:

* + 1. Leon Shklar and Rich Rosen, Web Application Architecture, 2nd Edition, JWI.
    2. Rosenfeld L, Information Architecture for the World Wide Web, 2nd Edition, O'Reilly 2002
    3. Deitel, Deitel and Goldberg, Internet and World Wide Web - How To Program, 3rd Edition, Prentice Hall 2004
    4. Gerti Kappel, Birgit Proll, Siegfried Reich, Werner Retschitzegger, Web Engineering, JWI 2006
    5. Various WWW sources

**Assessment Strategy:**

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| **Assessment Method** | **Contribution to the final mark** |
| Mid Term Examinations: | 30% (15 + 15) |
| Final Examination: | 40% |
| Quizzes: | 15% |
| Assignment / Mini Project: | 15% |

**Lectures and Labs**

Introduction (covered in first week): Computing with Services (Vision of Web, Open Environments, Web Services), Evolving Web, Standard Bodies.

Basic Standards: XML, SOAP, WSDL, Directory Services, UDDI.

Programming Web Services: Representational state transfer (REST), SOAP and REST examples, Web Services Interoperability.

Enterprise Architectures: Enterprise Integration, J2EE, .NET, Model-Driven Architecture, Legacy Systems.

Modelling and Representation: Modelling to enable interoperation, integration, common ontologies, knowledge representations.

RDF: RDF Basics, key primitives, XML syntax, N-Triples notations, RDF schema, vocabularies in RDF.

Web Ontology Language: OWL Dialects, Constructors, Axioms, OWL Inference.

Search Technologies: Overview of Algorithms, Searching Web, Site Search Applications, Search Engine Optimization.